

# Tiny video equipment, instruments

Fiber-optic tubes fitted with tiny telescopic lens, miniature lights and palm-size video cameras are making it possible for surgeons to perform operations through incisions smaller than your smallest fingertip.

They repair hernias, joints and blood vessels, remove cysts, tumors, kidneys and gallbladders, and perform hysterectomies and colon resections.

Trauma teams use the fiber-optic tubes, called scopes, to determine the extent of injuries, and at times proceed to repair the injuries.

Other surgeons use scopes to determine how far cancer has progressed and if surgical removal is possible.

"The list goes on and on and on," said Constantine Frantzides, MD, PhD, assistant professor of surgery.

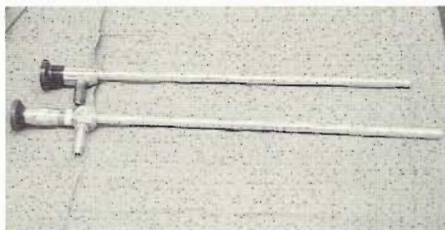
Scopes are used with hollow tubes, called trocars, miniature forceps, scissors and other tools that are inserted through the trocars. Lasers also are often used with scopes.

Scopes vary in length and thickness depending upon the type of surgery for which they are used.

Laparoscopes are used for abdominal operations, arthroscopes for joints, angioscopes for blood vessel walls, thorascopes for chests, etc.

Most of these minimally invasive operations require four or five quarter-inch incisions. The scope is inserted in one and relays a magnified view of the surgical area to a monitor.

Carbon dioxide often is pumped through a trocar in another incision to lift skin and tissue away from the



*Laparoscopes make it possible to do minimally invasive operations. During the operation a camera is mounted on the scope, which relays an image of the surgical area to monitors in the operating room.*

surrounding area to provide a better view and more space for the procedure.

Trocars—placed in the remaining incisions—provide access for the surgical instruments.

When an organ is too large to be removed through a trocar, it can be placed in a bag, emulsified and suctioned out.

The technology has revolutionized surgery because it is no longer necessary to make lengthy incisions through skin, muscle and fat.

"With this approach, the patient experiences less trauma and pain, recovers faster, and the aesthetic results are superb," Dr. Frantzides explained.

Minimally invasive operations also costs less, hospital stays are reduced from weeks to a few days and patients return to work faster, he said.

## First in US to Perform Precise Ulcer Surgery

Dr. Frantzides performed the first laparoscopic highly selective vagotomy—an extremely precise ulcer operation—in the US.

The traditional highly selective



*Miniature instruments (foreground) have been designed to fit through narrow tubes for the operations. Larger, traditional instruments are shown in background.*

vagotomy has been used since 1957 to treat patients who don't respond to medication or have recurring ulcers. However, it requires an eight to 12-day hospital stay and four- to six-week recuperation period, Dr. Frantzides noted.

Patients often were reluctant to undergo the traditional operation because of the long recuperation period. Delays in surgical treatment sometimes led to bleeding or perforations of the stomach wall, he added.

"The laparoscopic procedure requires only two days in the hospital and patients go back to full activity in one week," Dr. Frantzides said.

"Now that we have a laparoscopic way to treat patients who don't respond to treatment, there is no reason for bleeding or perforations to develop."

At some point in his or her life one out of every 10 Americans will develop an ulcer. Ulcers are caused by the stomach producing too much acid. Vagus nerves, located along the front and back of the stomach, stimulate production of acid.

During highly selective vagotomy, surgeons cut the tiny

# and tubes revolutionize surgery



*Karen Mihalovich of Milwaukee suffered from ulcers for 12 years before undergoing laparoscopy to decrease the amount of acid being produced by her stomach. The ulcers caused diarrhea, vomiting and gnawing pain. Medication healed the ulcers, but they continually recurred. At one point, she developed a bleeding ulcer.*

*The laparoscopic technique relieved her symptoms. "I wouldn't hesitate to have the operation again. It's really improved my life," she said.*

*It also made it possible for her to recover quickly. "By the second day, I felt good and was ready to go home."*

*Here she is shown with her nine-year old son, Travis, working on his Cub Scout Pinewood Derby car.*

branches of the nerves that go to the part of the stomach where acid is produced and production decreases.

"The laparoscopic approach costs much less, not only when compared to the traditional operation, but also if you take into consideration that some of these patients have taken expensive medications every single day for many years," Dr. Frantzides noted.

Without ongoing medication or other therapy, 80 percent of all ulcers recur within one year. Many people take medication their entire lives.

## **Specialized training and experience necessary**

Specialized training and extensive experience are necessary for minimally invasive operations, Dr.

Frantzides explained. "In these operations, you don't see your hands. You watch your instruments on a monitor." Surgeons have to learn a different type of hand-eye coordination to perform the operations.

In addition, the image on the monitor is two-dimensional. "The surgeon has to mentally convert the image to three dimensions. By touching the tissue with our instruments, we gain a perception of depth."

Three-dimensional monitors have been developed and Dr. Frantzides expects them to be available in a few months.

*If you would like an appointment with an MCW physician, you or your primary care physician may call 259-3666. Call toll-free outside Milwaukee, 1-800-272-3666.*



*Constantine Frantzides, MD, PhD, practices surgery at Froedtert Memorial Lutheran Hospital.*